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JAMES W. HATTELL, Clerk  
by [Signature] Deputy Clerk

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF GEORGIA  
ATLANTA DIVISION

VIDEO ENHANCEMENT SOLUTIONS,  
L.L.C.,

Plaintiff,

v.

DENON ELECTRONICS (USA), L.L.C.,  
EPSON AMERICA, INC., ONKYO U.S.A.  
CORPORATION, PENTAX OF AMERICA,  
INC., RJ TECHNOLOGY, INC., SANYO  
NORTH AMERICA CORPORATION,  
TEAC AMERICA, INC., UNIBRAIN INC.,  
YAMAHA ELECTRONICS  
CORPORATION,

Defendants.

Civil Action No.

1 09-CV-3391

JOF

COMPLAINT

Plaintiff Video Enhancement Solutions, LLC ("VES") files this its  
Complaint against Defendants showing this Court as follows.

### NATURE OF THE ACTION

1.

This is an action for patent infringement, arising out of Defendants infringement of U.S. patents relating to the art of video compression and decompression. Specifically, this Complaint asserts claims against Defendants arising from their infringement of various claims in U.S. Pat. No. 7,397,965, issued on July 8, 2008, and entitled "Method of Encoding a Blocking Artifact When Coding Moving Picture" (the "'965 Patent") and U.S. Pat. No. 7,492,960, issued on February 17, 2009, and also entitled "Method of Encoding a Blocking Artifact When Coding Moving Picture" (the "'960 Patent"). [True and correct copies of the '965 Patent and the '960 Patent are attached hereto as Exhibits A and B, respectively.]

### THE PARTIES

2.

Plaintiff is a limited liability company, organized and existing under the laws of Texas. Plaintiff's principal place of business is located within this District.

3.

Upon information and belief, Defendant Denon Electronics (USA), L.L.C. ("Denon") is a limited liability company organized and existing under the laws

of the state of Delaware. Upon information and belief, Denon's principal place of business is located in Mahwah, New Jersey. Denon's registered agent for service of process is The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801.

4.

Upon information and belief, Defendant Epson America, Inc. ("Epson") is a corporation organized and existing under the laws of the state of California. Upon information and belief, Epson's principal place of business is located in Long Beach, California. Epson's registered agent for service of process is United States Corporation Company, 2730 Gateway Oaks Drive, Suite 100, Sacramento, California 95833.

5.

Upon information and belief, Defendant Onkyo U.S.A. Corporation ("Onkyo") is a corporation organized and existing under the laws of the state of Illinois. Upon information and belief, Onkyo's registered agent for service of process is Corporation Service Company, 801 Adlai Stevenson Drive, Springfield, Illinois 62703.

6.

Upon information and belief, Defendant Pentax of America, Inc. ("Pentax") is a corporation organized and existing under the laws of the state of Delaware. Upon information and belief, Pentax's principal place of business is located in Montvale, New Jersey. Pentax's registered agent for service of process is The Prentice Hall Corp. System, 40 Technology Parkway South, Suite 300, Norcross, Georgia 30092.

7.

Upon information and belief, Defendant RJ Technology, Inc. ("RJ") is a corporation organized and existing under the laws of the state of California. Upon information and belief, RJ's principal place of business is located at 13939 Central Avenue, Chino, California 91710. Defendant RJ has not appointed a registered agent for service of process in California.

8.

Upon information and belief, Defendant Sanyo North America Corporation ("Sanyo") is a corporation organized and existing under the laws of the state of Delaware. Upon information and belief, Sanyo's principal place of business is in San Diego, California. Defendant Sanyo's registered agent for

service of process is Corporation Service Company, 2730 Gateway Oaks Drive, Suite 100, Sacramento, California 95833.

9.

Upon information and belief, Defendant TEAC America, Inc. ("TEAC") is a corporation organized and existing under the laws of the state of California. Upon information and belief, TEAC's principal place of business is located in Montebello, California. TEAC's registered agent for service of process is Corporation Service Company, 2730 Gateway Oaks Drive, Suite 100, Sacramento, California 95833.

10.

Upon information and belief, Defendant Unibrain Inc. ("Unibrain") is a corporation organized and existing under the laws of the state of California. Upon information and belief, Unibrain's principal place of business is located in San Ramon, California. Unibrain's registered agent for service of process is Gregg Atkins, 2512 Canyon Village Circle, San Ramon, California 94583.

11.

Upon information and belief, Defendant Yamaha Electronics Corporation ("Yamaha") is a corporation organized and existing under the laws of the state of California. Upon information and belief, Yamaha's principal place of business is

located in Buena Park, California. Yamaha's registered agent for service of process is Corporation Service Company, 2730 Gateway Oaks Drive, Suite 100, Sacramento, California 95833.

**JURISDICTION AND VENUE**

12.

This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and/or 1338.

13.

This Court has personal jurisdiction over the Defendants pursuant to O.C.G.A. § 9-10-91.

14.

Venue is proper in this Court pursuant to 28 U.S.C. §§ 1391 and/or 1400.

**OPERATIVE FACTS**

**THE PATENTS-IN-SUIT**

15.

VES is the owner by assignment of all right, title, and interest in the '965 Patent and the '960 Patent (the '965 Patent and the '960 Patent are collectively referred to herein as the "Patents-in-Suit").

16.

The Patents-in-suit describe a novel method that reduces particular types of errors that can arise during video compression and playback called "blocking artifacts."

17.

Video compression is concerned with striking a balance between throwing away as much information as possible (to reduce file size) while having a minimal effect on the viewing experience for an end user.

18.

Most compression techniques take advantage of 2 redundancies in particular. The first is temporal redundancy and the second is spatial redundancy.

19.

Temporal redundancy notes that successive frames of pixels in a video sequence are very similar. Typically, a video plays at 20-30 frames per second. Because there is very little change in the pixels between frames occurring in  $1/30$  of a second, one may discard much of the information representing the new frame since it's redundant with the earlier frame. Instead of encoding the pixels in each frame independently, MPEG-based compression standards such as DivX

encode reference frames and then encode the difference between successive reference frames (using motion estimation to find the difference between frames).

20.

Spatial redundancy takes advantage of the fact that, in general, the intensity and color variations across image frames tends to be quite low in frequency. In other words, neighboring pixels tend to have similar intensity and color values. For example, in an image of a person wearing a blue shirt, all of the pixels that represent the shirt would have very similar intensity and color values. Furthermore, much of the high frequency detail is not readily perceived by the human eye and therefore does not need to be transmitted, stored or displayed.

21.

MPEG-based compression algorithms, including DivX, exploit spatial and temporal redundancy, and slowly varying colors and textures, by removing the redundant portions of the image data and only storing or transmitting the essential portion. These algorithms divide each frame into a grid of pixel matrices (typically 16x16 pixels) called macroblocks. Each macroblock is processed independently in the encoding process to remove redundant or unimportant data. When the image is to be displayed, each macroblock is



reconstructed from the compressed data, and then the macroblocks are arranged in a grid to form an output display image. Unfortunately, because of the information lost during the compression process, the displayed macroblocks often do not match perfectly in intensity and color along their edges. The resulting image exhibits noticeable and distracting lines at the boundaries between macroblocks, known as a "blocking artifact."

22.

The Patents-in-Suit disclose novel methods of reducing blocking artifacts by, among other things, applying a smoothing filter to pixels at and/or near the macroblock boundary during the playback of the video.

23.

Claim 1 of the '965 Patent provides:

1. A computer-implemented method comprising:

dividing a picture into blocks that each include multiple pixels, wherein a

first pixel of a first block is located across a block boundary from a

second pixel of an adjacent second block;

determining whether to modify the first pixel based on pixel values of at

least two pixels of the first block including the first pixel and at least

two pixels of the second block including the second pixel, and further based on a quantization parameter; and modifying, if it is determined to modify the first pixel, the first pixel using information from the second block.

'965 Patent, Col. 6, ll. 28-39

24.

Similarly, Claim 1 of the '960 Patent provides:

1. A computer-implemented method comprising:  
obtaining blocks that each include multiple pixels, a first pixel of a first block being separated from a second pixel of a neighboring second block by a block boundary;  
selecting a correction mode from amongst first and second correction modes using information from the first block and information from the second block;  
adjusting a first quantity of pixels including the first and second pixels if the first correction mode is selected; and  
adjusting a second, different quantity of pixels including the first and second pixels if the second correction mode is selected.

'960 Patent, Col. 6, ll. 27-38.

THE INFRINGING PRODUCTS

Defendant Denon's Products

25.

Defendant Denon, within the United States, manufactures, uses, offers for sale, or sells DVD players and other products, including, but not limited to, the DVD-1800BD, DVD-1940CI, and DVD-A1UDCI, (collectively, the "Denon Products"). The Denon Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

26.

The Denon Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

27.

Defendant Denon does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant Epson's Products

28.

Defendant Epson, within the United States, manufactures, uses, offers for sale, or sells photo players, projectors and other products, including, but not limited to, the P3000, MovieMate 55, and MovieMate 72, (collectively, the "Epson

Products"). The Epson Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

29.

The Epson Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

30.

Defendant Epson does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant Onkyo's Products

31.

Defendant Onkyo, within the United States, manufactures, uses, offers for sale, or sells DVD players and other products, including, but not limited to, the DV-SP406 and DV-SP502, (collectively, the "Onkyo Products"). The Onkyo Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

32.

The Onkyo Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

33.

Defendant Onkyo does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant Pentax's Products

34.

Defendant Pentax, within the United States, manufactures, uses, offers for sale, or sells cameras and other products, including, but not limited to, the Optio A30, Optio A40, and Optio S12, (collectively, the "Pentax Products"). The Pentax Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

35.

The Pentax Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

36.

Defendant Pentax does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant RJ's Products

37.

Defendant RJ, within the United States, manufactures, uses, offers for sale, or sells cameras and other products, including, but not limited to, the RJ-DMC04, (collectively, the "RJ Products"). The RJ Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

38.

The RJ Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

39.

Defendant RJ does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant Sanyo's Products

40.

Defendant Sanyo, within the United States, manufactures, uses, offers for sale, or sells navigation devices and other products, including, but not limited to, the Easy Street NVM 4070 (collectively, the "Sanyo Products"). The Sanyo Products, among other things, utilize information from surrounding pixels to

adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

41.

The Sanyo Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

42.

Defendant Sanyo does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant TEAC's Products

43.

Defendant TEAC, within the United States, manufactures, uses, offers for sale, or sells DVD players and other products, including, but not limited to, the DR-H300 (collectively, the "TEAC Products"). The TEAC Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

44.

The TEAC Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

45.

Defendant TEAC does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

Defendant Unibrain's Products

46.

Defendant Unibrain, within the United States, manufactures, uses, offers for sale, or sells portable media centers and other products, including, but not limited to, the iZak, (collectively, the "Unibrain Products"). The Unibrain Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

47.

The Unibrain Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

48.

Defendant Unibrain does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.



Defendant Yamaha's Products

49.

Defendant Yamaha, within the United States, manufactures, uses, offers for sale, or sells DVD players and other products, including, but not limited to, the DVD-S659, DVD-S661, and DVD S6160 (collectively, the "Yamaha Products"). The Yamaha Products, among other things, utilize information from surrounding pixels to adjust the pixel values located at the boundaries of macroblocks to reduce blocking artifacts.

50.

The Yamaha Products practice each limitation of the method set forth in at least claim 1 of the '965 Patent and Claim 1 of the '960 Patent.

51.

Defendant Yamaha does not have a license or other authorization to practice the claims set forth in either the '965 Patent or the '960 Patent.

52.

All conditions precedent to the assertion of the claims set forth in this Complaint have been satisfied or waived.

COUNT ONE

DENON'S INFRINGEMENT OF THE '965 PATENT

53.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-3, 12-27, and 52.

54.

By reason of some or all of the foregoing, Defendant Denon has infringed at least one claim of the '965 Patent.

55.

VES has suffered damages as the direct and proximate result of Defendant Denon's infringement of the '965 Patent.

COUNT TWO

DENON'S INFRINGEMENT OF THE '960 PATENT

56.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-3, 12-27, and 52.

57.

By reason of some or all of the foregoing, Defendant Denon has infringed at least one claim of the '960 Patent.

58.

VES has suffered damages as the direct and proximate result of Defendant Denon's infringement of the '960 Patent.

COUNT THREE

EPSON'S INFRINGEMENT OF THE '965 PATENT

59.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 4, 12-24, 28-30, and 52.

60.

By reason of some or all of the foregoing, Defendant Epson has infringed at least one claim of the '965 Patent.

61.

VES has suffered damages as the direct and proximate result of Defendant Epson's infringement of the '965 Patent.

COUNT FOUR

EPSON'S INFRINGEMENT OF THE '960 PATENT

62.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 4, 12-24, 28-30, and 52.

63.

By reason of some or all of the foregoing, Defendant Epson has infringed at least one claim of the '960 Patent.

64.

VES has suffered damages as the direct and proximate result of Defendant Epson's infringement of the '960 Patent.

COUNT FIVE

ONKYO'S INFRINGEMENT OF THE '965 PATENT

65.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 5, 12-24, 31-33, and 52.

66.

By reason of some or all of the foregoing, Defendant Onkyo has infringed at least one claim of the '965 Patent.

67.

VES has suffered damages as the direct and proximate result of Defendant Onkyo's infringement of the '965 Patent.

COUNT SIX

ONKYO'S INFRINGEMENT OF THE '960 PATENT

68.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 5, 12-24, 31-33, and 52.

69.

By reason of some or all of the foregoing, Defendant Onkyo has infringed at least one claim of the '960 Patent.

70.

VES has suffered damages as the direct and proximate result of Defendant Onkyo's infringement of the '960 Patent.

COUNT SEVEN

PENTAX'S INFRINGEMENT OF THE '960 PATENT

71.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 6, 12-24, 34-36, and 52.

72.

By reason of some or all of the foregoing, Defendant Pentax has infringed at least one claim of the '960 Patent.

73.

VES has suffered damages as the direct and proximate result of Defendant Pentax's infringement of the '960 Patent.

COUNT EIGHT

PENTAX'S INFRINGEMENT OF THE '965 PATENT

74.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 6, 12-24, 34-36, and 52.

75.

By reason of some or all of the foregoing, Defendant Pentax has infringed at least one claim of the '965 Patent.

76.

VES has suffered damages as the direct and proximate result of Defendant Pentax's infringement of the '965 Patent.

COUNT ELEVEN

PIONEER'S INFRINGEMENT OF THE '960 PATENT

77.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 7, 12-24, 37-39, and 52.

78.

By reason of some or all of the foregoing, Defendant Pioneer has infringed at least one claim of the '960 Patent.

79.

VES has suffered damages as the direct and proximate result of Defendant Pioneer's infringement of the '960 Patent.

COUNT NINE

RJ'S INFRINGEMENT OF THE '965 PATENT

80.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 7, 12-24, 37-39, and 52.

81.

By reason of some or all of the foregoing, Defendant RJ has infringed at least one claim of the '965 Patent.

82.

VES has suffered damages as the direct and proximate result of Defendant RJ's infringement of the '965 Patent.

COUNT TEN

RJ'S INFRINGEMENT OF THE '960 PATENT

83.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 7, 12-24, 37-39, and 52.

84.

By reason of some or all of the foregoing, Defendant RJ has infringed at least one claim of the '960 Patent.

85.

VES has suffered damages as the direct and proximate result of Defendant RJ's infringement of the '960 Patent.

COUNT ELEVEN

SANYO'S INFRINGEMENT OF THE '965 PATENT

86.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 8, 12-24, 40-42, and 52.

87.

By reason of some or all of the foregoing, Defendant Sanyo has infringed at least one claim of the '965 Patent.



88.

VES has suffered damages as the direct and proximate result of Defendant Sanyo's infringement of the '965 Patent.

COUNT TWELVE

SANYO'S INFRINGEMENT OF THE '960 PATENT

89.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 8, 12-24, 40-42, and 52.

90.

By reason of some or all of the foregoing, Defendant Sanyo has infringed at least one claim of the '960 Patent.

91.

VES has suffered damages as the direct and proximate result of Defendant Sanyo's infringement of the '960 Patent.

COUNT THIRTEEN

TEAC'S INFRINGEMENT OF THE '965 PATENT

92.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 9, 12-24, 43-45, and 52.

93.

By reason of some or all of the foregoing, Defendant TEAC has infringed at least one claim of the '965 Patent.

94.

VES has suffered damages as the direct and proximate result of Defendant TEAC's infringement of the '965 Patent.

COUNT FOURTEEN

TEAC'S INFRINGEMENT OF THE '960 PATENT

95.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 9, 12-24, 43-45, and 52.

96.

By reason of some or all of the foregoing, Defendant TEAC has infringed at least one claim of the '960 Patent.

97.

VES has suffered damages as the direct and proximate result of Defendant TEAC's infringement of the '960 Patent.

COUNT FIFTEEN

UNIBRAIN'S INFRINGEMENT OF THE '965 PATENT

98.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 10, 12-24, 46-48, and 52.

99.

By reason of some or all of the foregoing, Defendant Unibrain has infringed at least one claim of the '965 Patent.

100.

VES has suffered damages as the direct and proximate result of Defendant Unibrain's infringement of the '965 Patent.

COUNT SIXTEEN

UNIBRAIN'S INFRINGEMENT OF THE '960 PATENT

101.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 10, 12-24, 46-48, and 52.

102.

By reason of some or all of the foregoing, Defendant Unibrain has infringed at least one claim of the '960 Patent.

103.

VES has suffered damages as the direct and proximate result of Defendant Unibrain's infringement of the '960 Patent.

COUNT SEVENTEEN

YAMAHA'S INFRINGEMENT OF THE '965 PATENT

104.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 11, 12-24, 49-52.

105.

By reason of some or all of the foregoing, Defendant Yamaha has infringed at least one claim of the '965 Patent.

106.

VES has suffered damages as the direct and proximate result of Defendant Yamaha's infringement of the '965 Patent.

COUNT EIGHTEEN

YAMAHA'S INFRINGEMENT OF THE '960 PATENT

107.

VES incorporates by reference as if fully set forth herein the averments contained within Paragraphs 1-2, 11, 12-24, 49-52.

108.

By reason of some or all of the foregoing, Defendant Yamaha has infringed at least one claim of the '960 Patent.

109.

VES has suffered damages as the direct and proximate result of Defendant Yamaha's infringement of the '960 Patent.

WHEREFORE, VES prays that this Court:

- (1) Enter judgment in favor of VES and against Defendants for infringement of the '965 Patent;
- (2) Award damages to VES in an amount to be proven at trial for Defendants' infringement of the '965 Patent, pursuant to 35 U.S.C. § 284;
- (3) Enter judgment in favor of VES and against Defendants for infringement of the '960 Patent;
- (4) Award damages to VES in an amount to be proven at trial for Defendants' infringement of the '960 Patent, pursuant to 35 U.S.C. § 284;
- (5) This case be tried before a jury; and

(6) VES have such other and further relief as the Court deems just and proper, premises considered.

This 3rd day of December, 2009.

Respectfully submitted,

MORRIS, MANNING & MARTIN, LLP

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